

## REMARKS

### Inventorship

Applicants note with appreciation that the inventorship has been changed in accordance with papers filed under 37 CFR 1.48(b). Applicants note the USPTO PAIR database now shows Jeff Grotelueschen Hall as the first named inventor, and the first page of this paper therefore reflects the inventorship as corrected.

### Claim Rejections

Claims 101-125 are pending in the present case. The Examiner has raised the a number of objections and rejections. For clarity, these objections and rejections are summarized below in the order in which they are addressed:

1. Claims 101-125 stand rejected under 35 USC § 112, second paragraph as allegedly being indefinite;
2. Claims 101-125 stand rejected under 35 USC § 112, first paragraph as allegedly failing to comply with the written description requirement;
3. Claims 101-104, 107-112, 114-117, and 123-125 stand rejected as being allegedly being anticipated under 35 U.S.C. § 102(b) by Lyamichev, et al., Science 260:778 (1993), hereinafter "Lyamichev;"
4. Claims 101, 112-115, 117, 118, and 123 stand rejected as being allegedly being anticipated under 35 U.S.C. § 102(b) by Livak, PCR Methods and Applications vol. 4, pages 357-362, June 1995, hereinafter "Livak;"
5. Claims 101, 104-107, 114-119, and 122-125 stand rejected as being allegedly being anticipated under 35 U.S.C. § 102(b) by U.S. Patent No. 5,380, 833 to Urdea, hereinafter "Urdea;"
6. Claims 101, 107, 112-116, 120, 121, and 123-125 stand rejected as being allegedly being anticipated under 35 U.S.C. § 102(b) by Corey. J. Am. Chem. Soc., vol. 117, pages 9373-9374 (1995), hereinafter "Corey;"
7. Claims 101, 107-119, and 123 stand rejected as being allegedly being anticipated under 35 U.S.C. § 102(b) by U.S. Patent No. 5,691,146 to Mayrand, hereinafter "Mayrand."

#### 1. **35 USC § 112, second paragraph**

Claims 101-125 stand rejected under 35 USC § 112, second paragraph as allegedly being indefinite. In particular, the Examiner asserts that Claim 101 is indefinite, alleging that it is unclear what is being referred to as "said first portion." Claim 113 is rejected as indefinite in that

it allegedly recites “said first target nucleic acid” and “said first portion” without antecedent basis for these terms.

For business reasons and without acquiescing to the Examiner’s arguments, Claim 101 is herein amended to recite “said first region.” A first region of a target nucleic acid provides antecedent for this term. As such, the claim is not indefinite. Claim 113 is herein amended to recite “said target nucleic acid” and “said first region.” Each of these terms has antecedent basis in Claim 101. The amendments to the claims made herein do not narrow the scope of the claims within the meaning of *Festo*<sup>1</sup> or related cases. In view of the present amendments, Claims 101-125 are not indefinite and Applicants respectfully request that these rejections be removed.

**2. 35 USC § 112, first paragraph**

Claims 101-125 stand rejected under 35 USC § 112, first paragraph as allegedly failing to comply with the written description requirement. In particular, the Examiner asserts that the claims comprise new matter with respect to the claimed “kits.” For business reasons and without acquiescing to the Examiner’s arguments, Applicants herein amend Claims 101-125 to recite “a set of reagents”. These amendments to the claims do not narrow the scope of the claims within the meaning of *Festo*<sup>1</sup> or related cases. The specification provides support for the claimed reagents, *e.g.*, at page 171, lines 6-7, reciting “the invention provides reagents and methods to permit the detection and characterization of nucleic acid sequences.” As such, these claims do not comprise new matter and Applicants respectfully request that this rejection be removed.

**3-7. 35 U.S.C. § 102(b)**

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. MPEP 2131, citing *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d. 628, 631, 2 USPQ2d 1051, 1053 (*Fed. Cir.* 1987). As explained in more detail below, none of the references cited sets forth each and every element of the rejected claims.

**3. Lyamichev**

Claims 101-104, 107-112, 114-117, and 123-125 stand rejected as being allegedly being anticipated under 35 U.S.C. § 102(b) by Lyamichev. These claims are drawn to a set of reagents comprising oligonucleotides that are complementary to defined regions of a target nucleic acid.. The oligonucleotides, when associated with a target nucleic acid according to the recited regions of complementarity, form a nucleic acid cleavage structure cleavable by a cleavage agent.

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<sup>1</sup>*Festo Corp. v. Shokestu Kinzoku Kogyo Kabushiki Co.*, 122 S. Ct. 1831 (2002)

Claim 101 recites a first oligonucleotide and a second oligonucleotide that are complementary to a target nucleic acid (e.g., a nucleic acid to be detected or characterized). A target nucleic acid to be treated using the claimed reagents comprises two regions that are contiguous to each other, with the second region being downstream of the first region; “downstream” refers to the 3’ direction along a nucleic acid strand (see, e.g., the specification at page 29, lines 11-13). The first oligonucleotide comprises a portion that is completely complementary to the first region of said target nucleic acid. The second nucleic acid molecule comprises several features: it comprises a 5’ portion that is completely complementary to the second region of the target nucleic acid, and it additionally comprises a 3’ portion. When aligned with the target nucleic acid according to the various complementary portions, the first and second nucleic acid molecules can anneal to the target such that the contiguous first and second regions of the target are both completely annealed to form contiguous duplexes. When the nucleic acids are annealed in this fashion, the 3’ portion of the second nucleic acid molecule overlaps with the duplex formed by the first nucleic acid molecule and the target nucleic acid. See, e.g., Figure 32C.

Lyamichev fails to teach or suggest reagents comprising first and second oligonucleotides that anneal to contiguous regions of a target nucleic acid, wherein the second oligonucleotide further comprises a 3’ portion. Comparing the structures of Lyamichev to the structures that form with the use of the reagents of the present invention, the “substrate duplex” of Lyamichev (Figure 1A) can be compared to a duplex formed by between a target nucleic acid and the first oligonucleotide of the present invention. The “primer” of Lyamichev can be compared to the second oligonucleotide of the present invention. In the discussion of the primer, Lyamichev discusses primers that leave a gap between the 3’ end of the primer and the downstream substrate duplex and discloses primers that leave no gap (see, e.g., legend for Fig. 1, page 779). However, even while teaching primers that leave no gap, such that the primer duplex and the substrate duplex are contiguous, Lyamichev does not teach or suggest primers that additionally comprise a 3’ portion that can overlap with the substrate duplex. Thus, Lyamichev does not teach or suggest a primer or second oligonucleotide comprising a 3’ portion, such as is specified by the present claims. Lyamichev therefore fails to teach or suggest every element of Claims 101-104, 107-112, 114-117, and 123-125 and does not anticipate these claims. As such, Applicants respectfully request that this rejection be removed.

#### **4-7. Livak, Urdea, Corey, and Mayrand**

Claims 101, 107-119, 122-125 stand rejected as being allegedly being anticipated under 35 U.S.C. § 102(b) by one or more of the Livak, Urdea, Corey, and Mayrand references. As described above, the presently claimed reagents comprise first and second oligonucleotides that

can anneal to contiguous regions of a target nucleic acid, wherein the second oligonucleotide further comprises a 3' portion. Livak, Urdea, Corey, and Mayrand each fail to teach reagents comprising first and second oligonucleotides that can anneal to contiguous regions of a target nucleic acid, wherein the second oligonucleotide further comprises a 3' portion. As such, each of these references fails to teach or suggest every element of Claim 101 and dependent Claims 107-119, 122-125, and thus none of these references anticipate any one of these claims. Applicants therefore respectfully request that these rejections be removed.

## CONCLUSION

For the reasons set forth above, it is respectfully submitted that all rejections have been addressed and should be removed, and Applicants' claims should be passed to allowance. Should the Examiner believe that a telephone interview would aid in the prosecution of this application, Applicants encourages the Examiner to call the undersigned collect at (608) 218-6900.

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Mary Ann D. Brow  
Registration No. 42,363  
MEDLEN & CARROLL, LLP  
101 Howard Street, Suite 350  
San Francisco, California 94105